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(54) **LOCATION BASED TRACKING**

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(52) **U.S. Cl.**

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CPC ... G01C 21/00; G01C 21/20; H04M 1/72572; H04M 2250/12

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See application file for complete search history.

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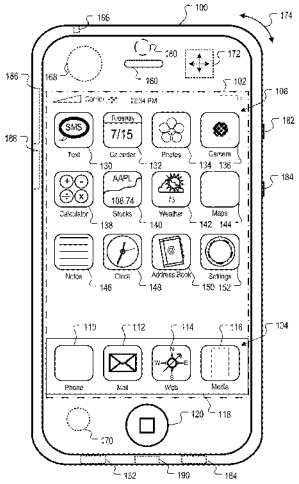
(57) **ABSTRACT**

Location information is used to build a database of locations having associated audio, video, image, or text data. In some implementations, a device includes a touch-sensitive display and collects data associated with a geographic location of interest. The geographic location of interest can be displayed on a map using an indicator. A touch selection of the indicator provides access to the data through an interface displayed on the touch-sensitive display. One or more locations of interest can be displayed and grouped together by an attribute.

21 Claims, 7 Drawing Sheets



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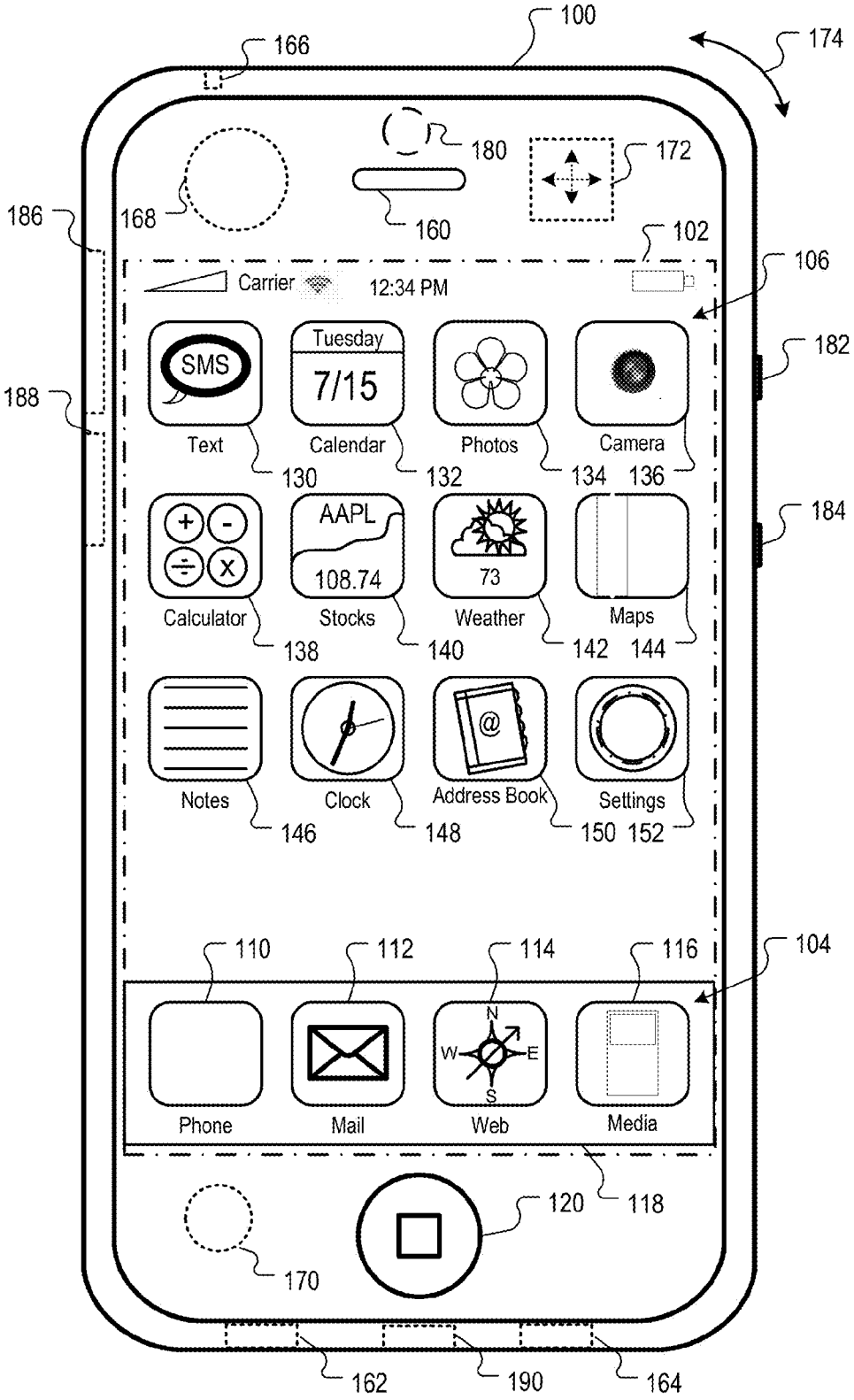

100
166
174
180
172
168
160
186
102
106
Carrier
12:34 PM
182
188
SMS
Tuesday
7/15
Text
Calendar
Photos
Camera
130
132
134
136
184
AAPL
108.74
73
Calculator
Stocks
Weather
Maps
138
140
142
144
Notes
Clock
Address Book
Settings
146
148
150
152
110
112
114
116
104
Phone
Mail
Web
Media
N
W
E
S
120
118
170
162
190
164

FIG. 1

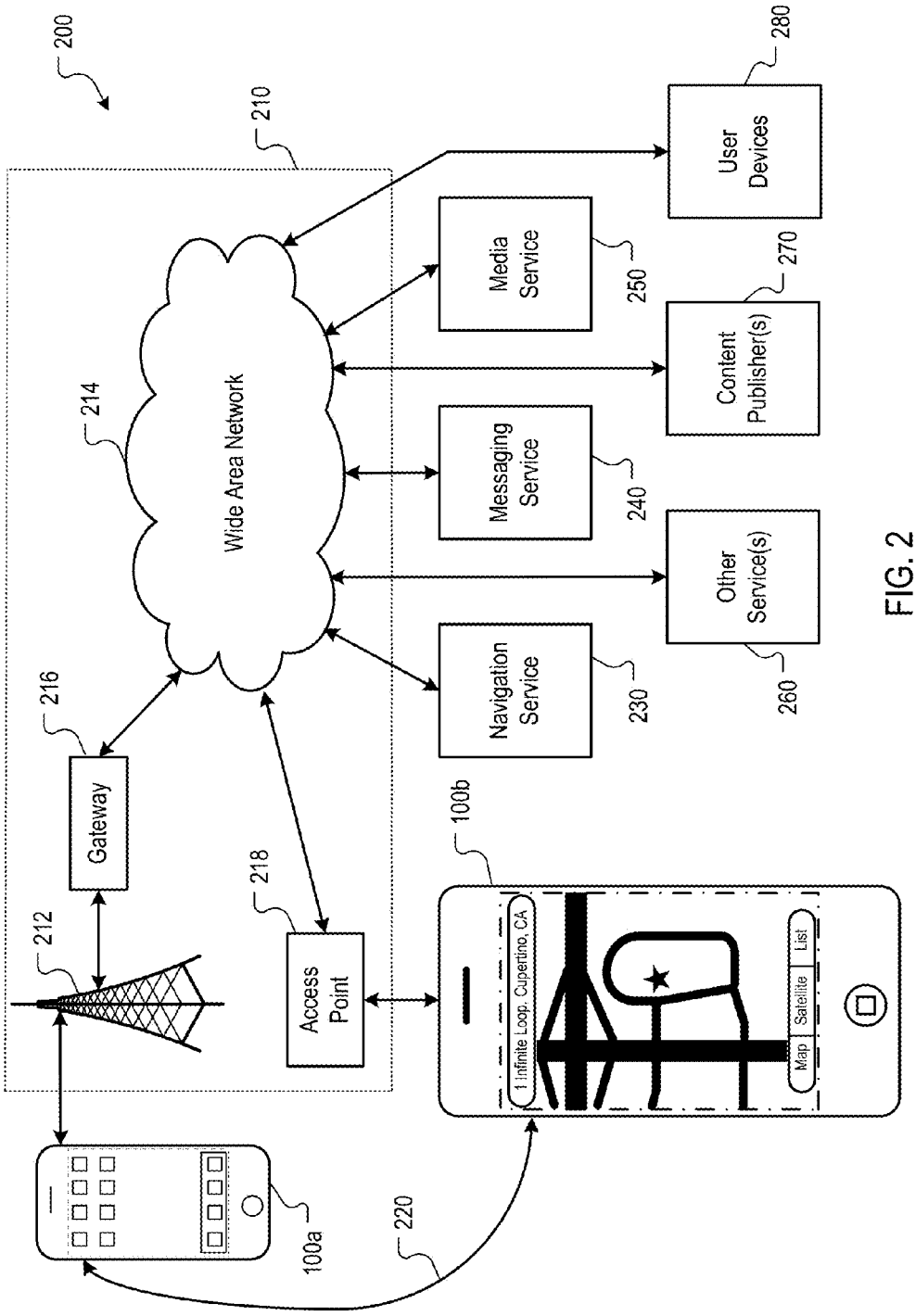

200
210
214
Wide Area Network
216
Gateway
212
218
Access Point
100a
100b
220
Navigation Service
230
Messaging Service
240
Media Service
250
Other Service(s)
260
Content Publisher(s)
270
User Devices
280
1 Infinite Loop, Cupertino, CA
Map
Satellite
List

FIG. 2

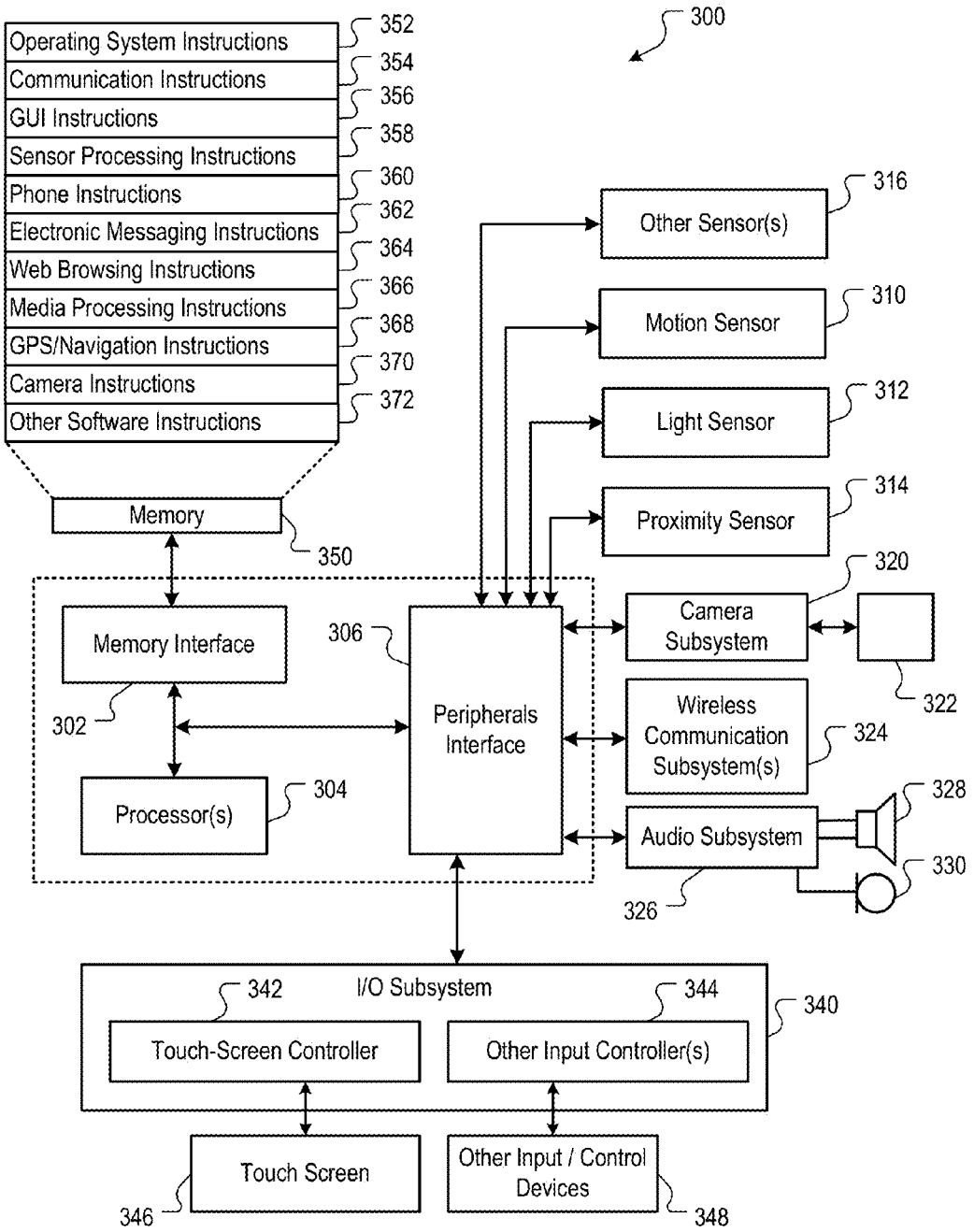

300
Operating System Instructions
352
Communication Instructions
354
GUI Instructions
356
Sensor Processing Instructions
358
Phone Instructions
360
Electronic Messaging Instructions
362
Web Browsing Instructions
364
Media Processing Instructions
366
GPS/Navigation Instructions
368
Camera Instructions
370
Other Software Instructions
372
Memory
350
Memory Interface
302
Processor(s)
304
306
Peripherals Interface
Other Sensor(s)
316
Motion Sensor
310
Light Sensor
312
Proximity Sensor
314
Camera Subsystem
320
322
Wireless Communication Subsystem(s)
324
Audio Subsystem
326
328
330
I/O Subsystem
340
342
344
Touch-Screen Controller
Other Input Controller(s)
Touch Screen
346
Other Input / Control Devices
348

FIG. 3

FIG. 4

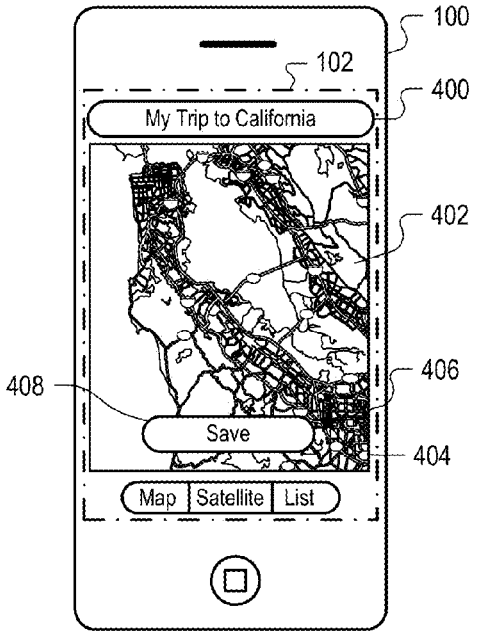


FIG. 5

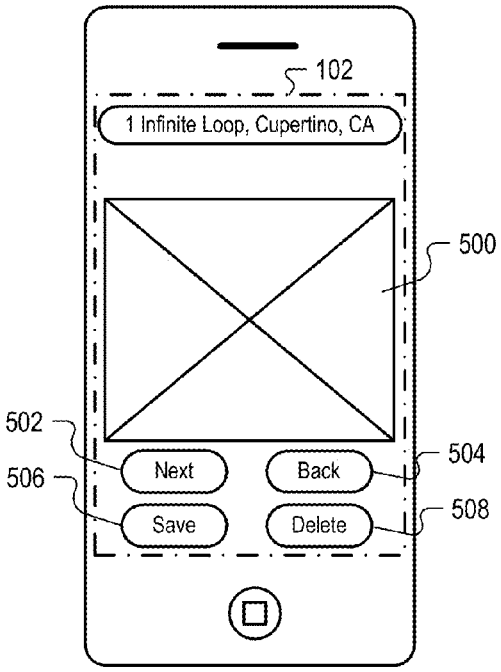


FIG. 6

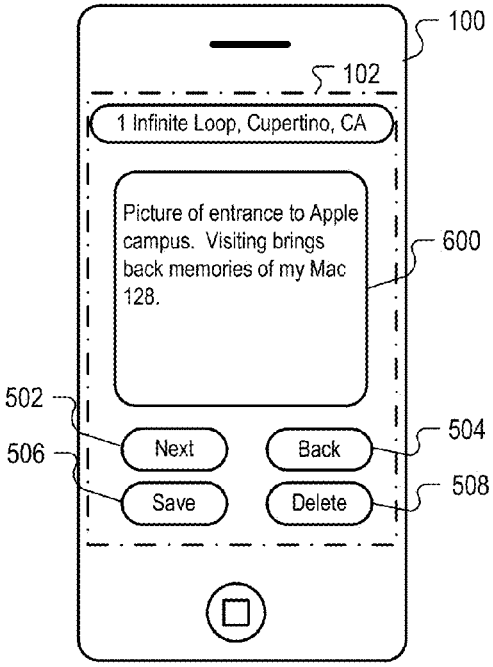


FIG. 7

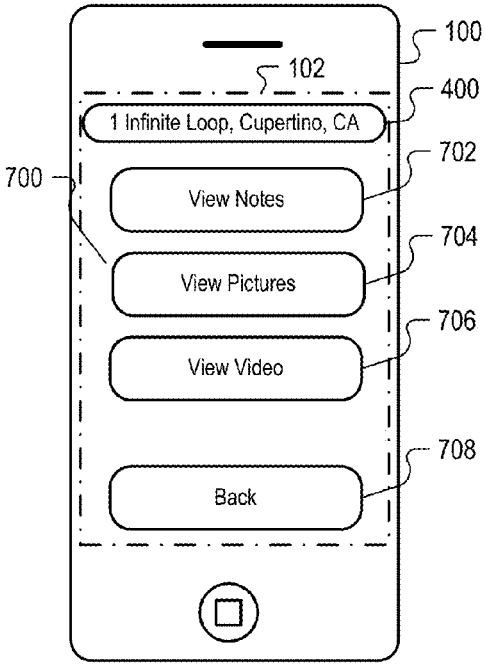


FIG. 8

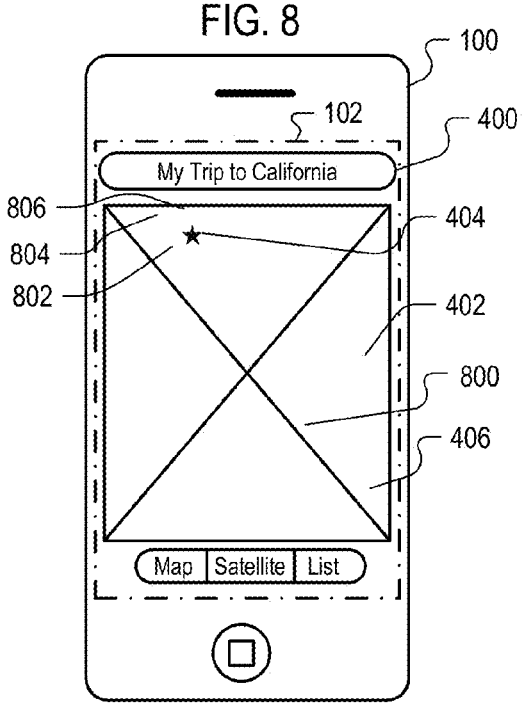


FIG. 9

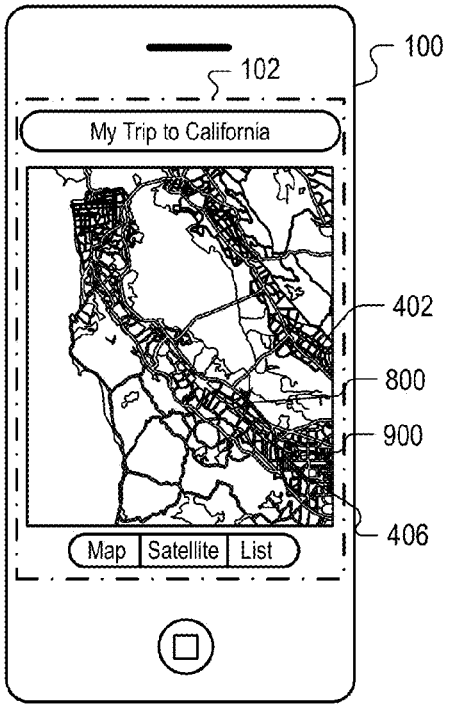


FIG. 10

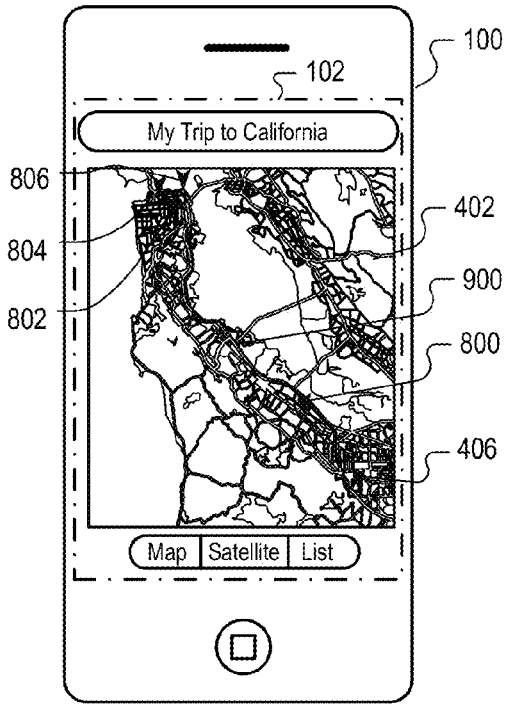


FIG. 11

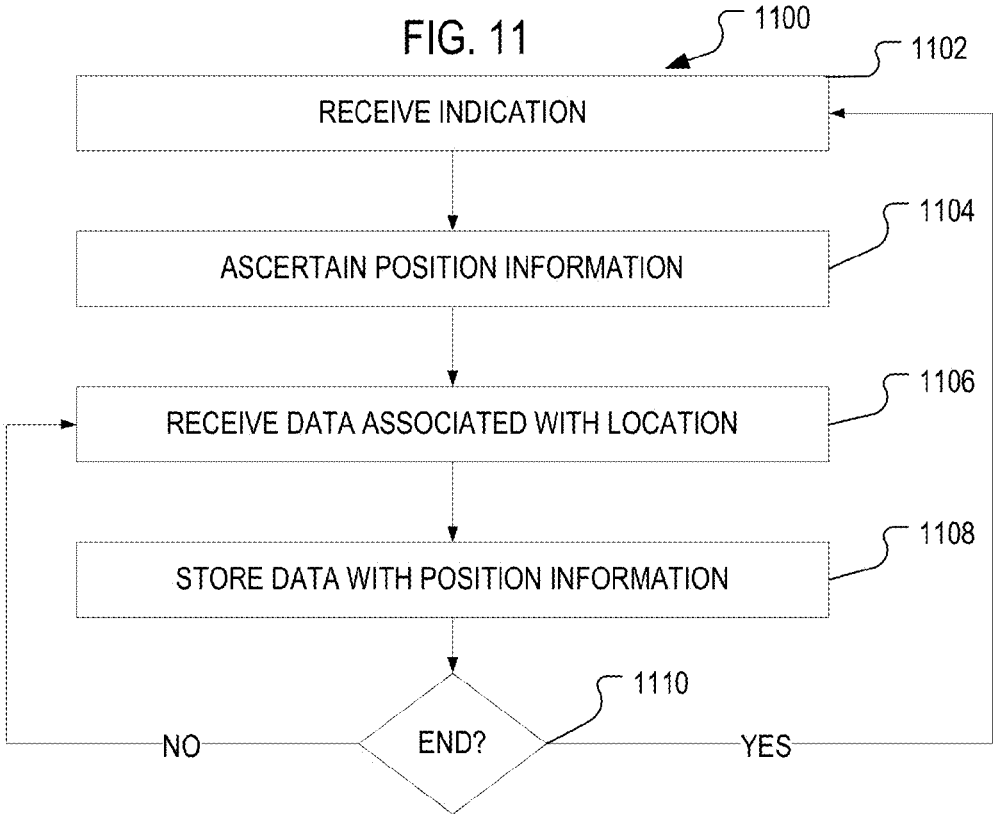

1100
1102
RECEIVE INDICATION
1104
ASCERTAIN POSITION INFORMATION
1106
RECEIVE DATA ASSOCIATED WITH LOCATION
1108
STORE DATA WITH POSITION INFORMATION
1110
END?
NO
YES

FIG. 12

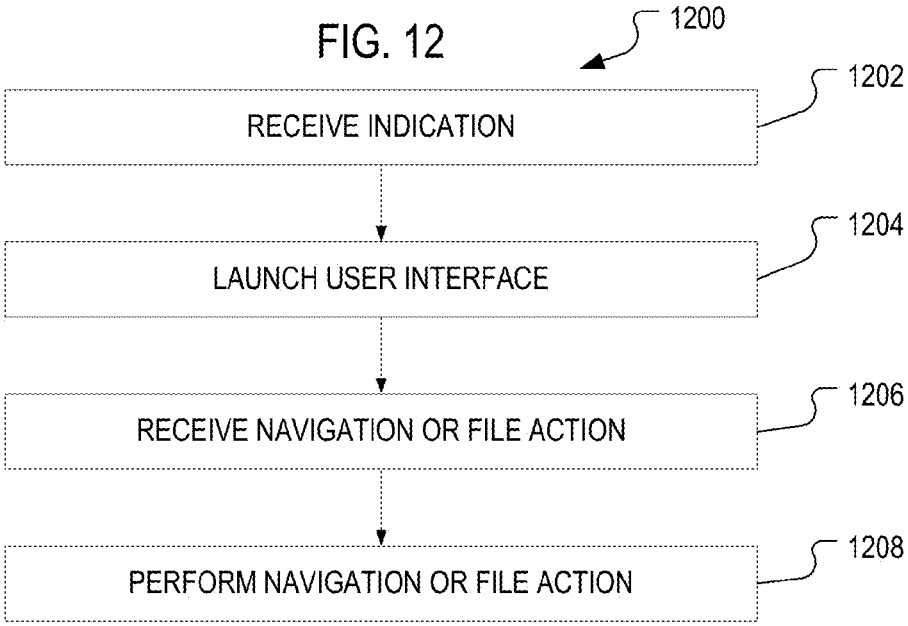

1200
1202
RECEIVE INDICATION
1204
LAUNCH USER INTERFACE
1206
RECEIVE NAVIGATION OR FILE ACTION
1208
PERFORM NAVIGATION OR FILE ACTION

FIG. 13

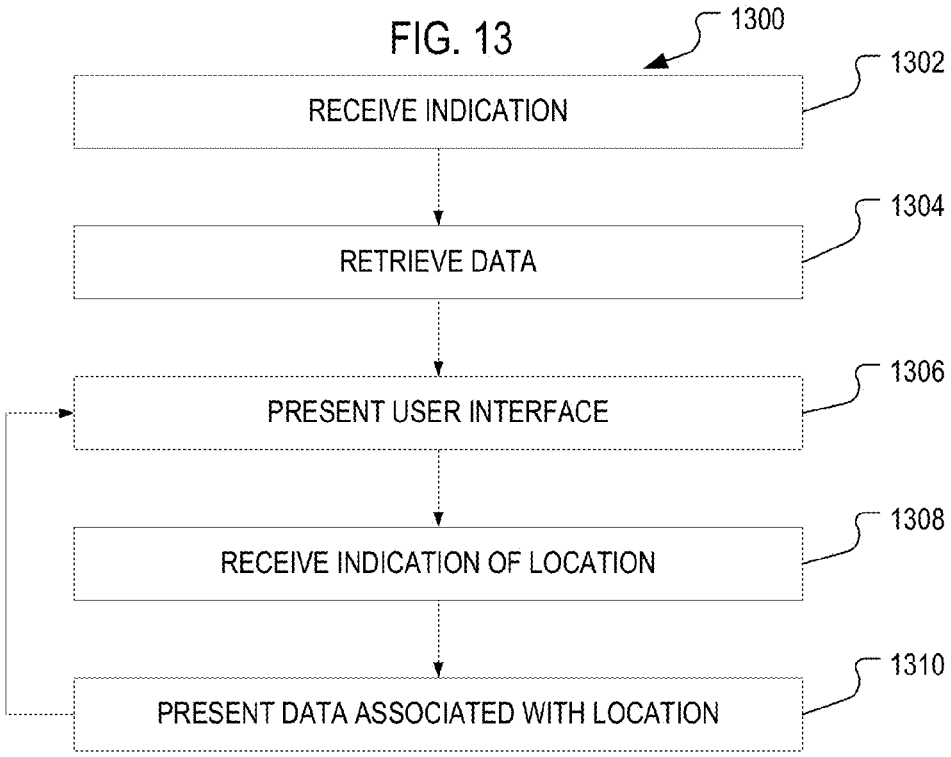
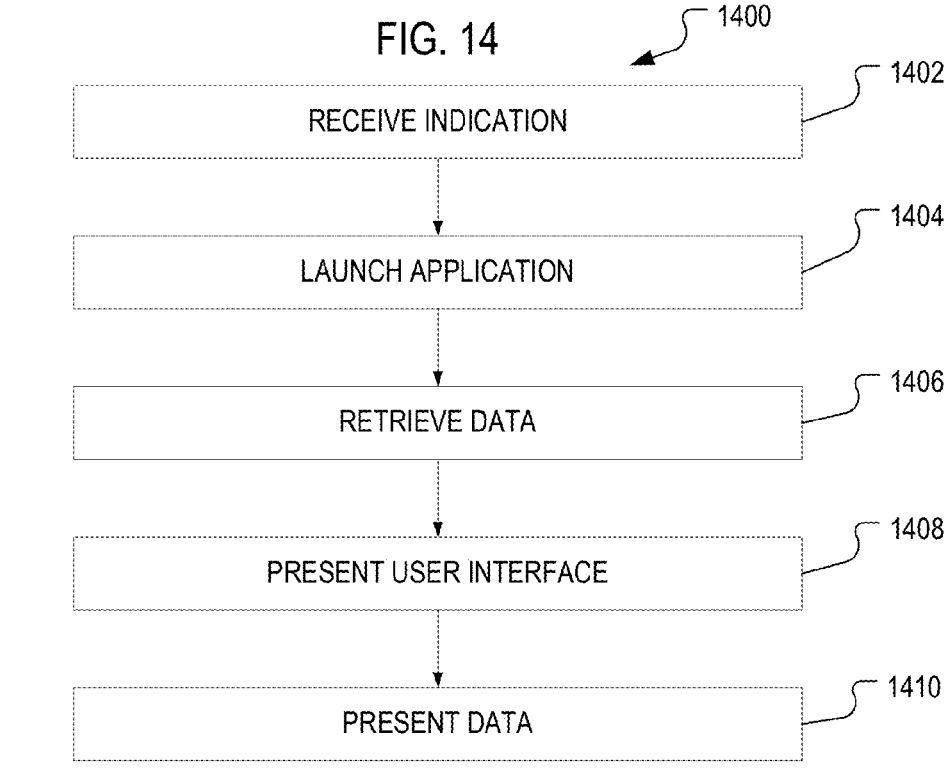

1300
RECEIVE INDICATION
1302
RETRIEVE DATA
1304
PRESENT USER INTERFACE
1306
RECEIVE INDICATION OF LOCATION
1308
PRESENT DATA ASSOCIATED WITH LOCATION
1310

FIG. 14


1400
RECEIVE INDICATION
1402
LAUNCH APPLICATION
1404
RETRIEVE DATA
1406
PRESENT USER INTERFACE
1408
PRESENT DATA
1410

LOCATION BASED TRACKING

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/361,897, filed Jan. 30, 2012, and entitled "LOCATION BASED TRACKING," which is a continuation of U.S. patent application Ser. No. 12/164,866, filed Jun. 30, 2008, and entitled "LOCATION BASED TRACKING," which claims priority to U.S. Provisional Patent Application Ser. No. 60/946,813 filed Jun. 28, 2007, and entitled LOCATION BASED TRACKING," the contents of each of which are incorporated herein by reference.

TECHNICAL FIELD

The subject matter of this patent application is generally related to location based services.

BACKGROUND

Mobile devices have grown more powerful and feature-rich and now include such features as personal digital assistant (PDA) capabilities, cameras to capture video and still images, Internet access, etc. Location-based services have been developed for determining and tracking the locations of the users of mobile devices. Location-based services provide location-specific information to mobile devices, including, for example, global positioning system (GPS) data to locate the mobile device on a map of a geographic region.

A number of applications are available for aiding users in navigation and route planning. Some of these applications use mobile devices containing global positioning systems to define the location of the mobile device and plan a route to a desired destination. Currently, however, these route planning systems do not provide a way to document items of interest to a user while a route is traveled. In conventional systems, the information the route planning systems provide is limited to what is pre-programmed. This information can become obsolete in time and may be of little or no interest to the user.

SUMMARY

Location information is used to build a database of locations having associated audio, video, image, or text data.

In some implementations, a method includes: presenting a map of a geographic region on a touch-sensitive display; receiving touch input selecting a geographic location; determining geographic positioning information of the geographic location; receiving data in response to an input received by a touch-sensitive display; associating the data with the geographic positioning information of the geographic location to produce geographically tagged data; and storing the geographically-tagged data.

In some implementations a method includes: presenting indications of a predetermined group of geographic locations on a touch-sensitive display; receiving a selection of a geographic location from the group of geographic locations displayed on the touch-sensitive display; and presenting geographically tagged data associated with the geographic location in a user interface on the touch-sensitive display.

In some implementations, a user interface includes a touch-sensitive display area for displaying indications of a predetermined group of geographic locations associated by an attribute, wherein each indication represents geographically coded data associated with a geographic position, and wherein a name of the attribute is displayed in the user interface.

Other implementations are disclosed, including implementations directed to systems, methods, apparatuses, computer-readable mediums and user interfaces.

DESCRIPTION OF DRAWINGS

FIG. **1** is a block diagram of an example mobile device.

FIG. **2** is a block diagram of an example network operating environment for the mobile device of FIG. **1**.

FIG. **3** is a block diagram of an example implementation of the mobile device of FIG. **1**.

FIGS. **4-10** are exemplary interfaces to input, review and display data associated with geographic locations of interest.

FIG. **11** is a flow diagram of an example process for indicating geographic locations of interest.

FIG. **12** is a flow diagram of an example process for reviewing and editing data associated with geographic locations of interest.

FIG. **13** is a flow diagram of an example process for interactively displaying data associated with geographic locations of interest.

FIG. **14** is a flow diagram of an example process for playback of data associated with geographic locations of interest.

DETAILED DESCRIPTION

FIG. **1** is a block diagram of an example mobile device **100**. The mobile device **100** can be, for example, a handheld computer, a personal digital assistant, a cellular telephone, a network appliance, a camera, a smart phone, an enhanced general packet radio service (EGPRS) mobile phone, a network base station, a media player, a navigation device, an email device, a game console, or other electronic device, a combination of any two or more of these data processing devices or other data processing devices.

Mobile Device Overview

In some implementations, the mobile device **100** includes a touch-sensitive display **102**. The touch-sensitive display **102** can implement liquid crystal display (LCD) technology, light emitting polymer display (LPD) technology, or some other display technology. The touch-sensitive display **102** can be sensitive to haptic and/or tactile contact with a user.

In some implementations, the touch-sensitive display **102** can comprise a multi-touch-sensitive display **102**. A multi-touch-sensitive display **102** can, for example, process multiple simultaneous touch points, including processing data related to the pressure, degree and/or position of each touch point. Such processing facilitates gestures and interactions with multiple fingers, chording, and other interactions. Other touch-sensitive display technologies can also be used, e.g., a display in which contact is made using a stylus or other pointing device. Some examples of multi-touch-sensitive display technology are described in U.S. Pat. Nos. 6,323,846, 6,570,557, 6,677,932, and U.S. Patent Publication 2002/0015024A1, each of which is incorporated by reference herein in its entirety.

In some implementations, the mobile device **100** can display one or more graphical user interfaces on the touch-sensitive display **102** for providing the user access to various system objects and for conveying information to the user. In some implementations, the graphical user interface can include one or more display objects **104**, **106**. In the example

shown, the display objects **104**, **106**, are graphic representations of system objects. Some examples of system objects include device functions, applications, windows, files, alerts, events, or other identifiable system objects.

Exemplary Mobile Device Functionality

In some implementations, the mobile device **100** can implement multiple device functionalities, such as a telephony device, as indicated by a phone object **110**; an e-mail device, as indicated by the e-mail object **112**; a network data communication device, as indicated by the Web object **114**; a Wi-Fi base station device (not shown); and a media processing device, as indicated by the media player object **116**. In some implementations, particular display objects **104**, e.g., the phone object **110**, the e-mail object **112**, the Web object **114**, and the media player object **116**, can be displayed in a menu bar **118**. In some implementations, device functionalities can be accessed from a top-level graphical user interface, such as the graphical user interface illustrated in FIG. **1**. Touching one of the objects **110**, **112**, **114** or **116** can, for example, invoke corresponding functionality.

In some implementations, the mobile device **100** can implement network distribution functionality. For example, the functionality can enable the user to take the mobile device **100** and its associated network while traveling. In particular, the mobile device **100** can extend Internet access (e.g., Wi-Fi) to other wireless devices in the vicinity. For example, mobile device **100** can be configured as a base station for one or more devices. As such, mobile device **100** can grant or deny network access to other wireless devices.

In some implementations, upon invocation of device functionality, the graphical user interface of the mobile device **100** changes, or is augmented or replaced with another user interface or user interface elements, to facilitate user access to particular functions associated with the corresponding device functionality. For example, in response to a user touching the phone object **110**, the graphical user interface of the touch-sensitive display **102** may present display objects related to various phone functions; likewise, touching of the email object **112** may cause the graphical user interface to present display objects related to various e-mail functions; touching the Web object **114** may cause the graphical user interface to present display objects related to various Web-surfing functions; and touching the media player object **116** may cause the graphical user interface to present display objects related to various media processing functions.

In some implementations, the top-level graphical user interface environment or state of FIG. **1** can be restored by pressing a button **120** located near the bottom of the mobile device **100**. In some implementations, each corresponding device functionality may have corresponding "home" display objects displayed on the touch-sensitive display **102**, and the graphical user interface environment of FIG. **1** can be restored by pressing the "home" display object.

In some implementations, the top-level graphical user interface can include additional display objects **106**, such as a short messaging service (SMS) object **130**, a calendar object **132**, a photos object **134**, a camera object **136**, a calculator object **138**, a stocks object **140**, a weather object **142**, a maps object **144**, a notes object **146**, a clock object **148**, an address book object **150**, and a settings object **152**. Touching the SMS display object **130** can, for example, invoke an SMS messaging environment and supporting functionality; likewise, each selection of a display object **132**, **134**, **136**, **138**, **140**, **142**, **144**, **146**, **148**, **150** and **152** can invoke a corresponding object environment and functionality.

Additional and/or different display objects can also be displayed in the graphical user interface of FIG. **1**. For example, if the device **100** is functioning as a base station for other devices, one or more "connection" objects may appear in the graphical user interface to indicate the connection. In some implementations, the display objects **106** can be configured by a user, e.g., a user may specify which display objects **106** are displayed, and/or may download additional applications or other software that provides other functionalities and corresponding display objects.

In some implementations, the mobile device **100** can include one or more input/output (I/O) devices and/or sensor devices. For example, a speaker **160** and a microphone **162** can be included to facilitate voice-enabled functionalities, such as phone and voice mail functions. In some implementations, a loud speaker **164** can be included to facilitate hands-free voice functionalities, such as speaker phone functions. An audio jack **166** can also be included for use of headphones and/or a microphone.

In some implementations, a proximity sensor **168** can be included to facilitate the detection of the user positioning the mobile device **100** proximate to the user's ear and, in response, to disengage the touch-sensitive display **102** to prevent accidental function invocations. In some implementations, the touch-sensitive display **102** can be turned off to conserve additional power when the mobile device **100** is proximate to the user's ear.

Other sensors can also be used. For example, in some implementations, an ambient light sensor **170** can be utilized to facilitate adjusting the brightness of the touch-sensitive display **102**. In some implementations, an accelerometer **172** can be utilized to detect movement of the mobile device **100**, as indicated by the directional arrow **174**. Accordingly, display objects and/or media can be presented according to a detected orientation, e.g., portrait or landscape. In some implementations, the mobile device **100** may include circuitry and sensors for supporting a location determining capability, such as that provided by the global positioning system (GPS) or other positioning systems (e.g., systems using Wi-Fi access points, television signals, cellular grids, Uniform Resource Locators (URLs)). In some implementations, a positioning system (e.g., a GPS receiver) can be integrated into the mobile device **100** or provided as a separate device that can be coupled to the mobile device **100** through an interface (e.g., port device **190**) to provide access to location-based services.

The mobile device **100** can also include a camera lens and sensor **180**. In some implementations, the camera lens and sensor **180** can be located on the back surface of the mobile device **100**. The camera can capture still images and/or video.

The mobile device **100** can also include one or more wireless communication subsystems, such as an 802.11b/g communication device **186**, and/or a Bluetooth™ communication device **188**. Other communication protocols can also be supported, including other 802.x communication protocols (e.g., WiMax, Wi-Fi, 3G), code division multiple access (CDMA), global system for mobile communications (GSM), Enhanced Data GSM Environment (EDGE), etc.

In some implementations, a port device **190**, e.g., a Universal Serial Bus (USB) port, or a docking port, or some other wired port connection, can be included. The port device **190** can, for example, be utilized to establish a wired connection to other computing devices, such as other communication devices **100**, network access devices, a personal computer, a printer, or other processing devices capable of receiving and/or transmitting data. In some implementations, the port device **190** allows the mobile device **100** to synchronize with

a host device using one or more protocols, such as, for example, the TCP/IP, HTTP, UDP and any other known protocol. In some implementations, a TCP/IP over USB protocol can be used.

Network Operating Environment

FIG. **2** is a block diagram of an example network operating environment **200** for the mobile device **100** of FIG. **1**. The mobile device **100** of FIG. **1** can, for example, communicate over one or more wired and/or wireless networks **210** in data communication. For example, a wireless network **212**, e.g., a cellular network, can communicate with a wide area network (WAN) **214**, such as the Internet, by use of a gateway **216**. Likewise, an access point **218**, such as an 802.11g wireless access point, can provide communication access to the wide area network **214**. In some implementations, both voice and data communications can be established over the wireless network **212** and the access point **218**. For example, the mobile device **100***a* can place and receive phone calls (e.g., using VoIP protocols), send and receive e-mail messages (e.g., using POP3 protocol), and retrieve electronic documents and/or streams, such as web pages, photographs, and videos, over the wireless network **212**, gateway **216**, and wide area network **214** (e.g., using TCP/IP or UDP protocols). Likewise, the mobile device **100***b* can place and receive phone calls, send and receive e-mail messages, and retrieve electronic documents over the access point **218** and the wide area network **214**. In some implementations, the mobile device **100** can be physically connected to the access point **218** using one or more cables and the access point **218** can be a personal computer. In this configuration, the mobile device **100** can be referred to as a "tethered" device.

The mobile devices **100***a* and **100***b* can also establish communications by other means. For example, the wireless device **100***a* can communicate with other wireless devices, e.g., other wireless devices **100**, cell phones, etc., over the wireless network **212**. Likewise, the mobile devices **100***a* and **100***b* can establish peer-to-peer communications **220**, e.g., a personal area network, by use of one or more communication subsystems, such as the Bluetooth™ communication device **188** shown in FIG. **1**. Other communication protocols and topologies can also be implemented.

The mobile device **100** can, for example, communicate with one or more services **230**, **240**, **250**, and **260** and/or one or more content publishers **270** over the one or more wired and/or wireless networks **210**. For example, a navigation service **230** can provide navigation information, e.g., map information, location information, route information, and other information, to the mobile device **100**. In the example shown, a user of the mobile device **100***b* has invoked a map functionality, e.g., by pressing the maps object **144** on the top-level graphical user interface shown in FIG. **1**, and has requested and received a map for the location "1 Infinite Loop, Cupertino, Calif."

User devices **280** can, for example, communicate with the one or more services **230**, **240**, **250** and **260** and/or one or more content publishes 260 over the one or more wired and/or wireless networks **210** to access content and services as well as communicate with the mobile device **100**. The user devices **280** can be, for example, a personal computer, a set top, a gaming device, a digital video recorder, a portable audio or video player, an in-vehicle navigation system, etc.

A messaging service **240** can, for example, provide e-mail and/or other messaging services. A media service **250** can, for example, provide access to media files, such as song files, movie files, video clips, and other media data. One or more other services **260** can also be utilized by the mobile device **100**.

The mobile device **100** can also access other data and content over the one or more wired and/or wireless networks **210**. For example, content publishers, e.g., content publisher(s) **270**, such as news sites, RSS feeds, web sites, blogs, social networking sites, developer networks, etc., can be accessed by the mobile device **100**. Such access can be provided by invocation of a web browsing function or application (e.g., a browser) in response to a user touching the Web object **114**.

Exemplary Mobile Device Architecture

FIG. **3** is a block diagram **300** of an example implementation of the mobile device **100** of FIG. **1**. The mobile device **100** can include a memory interface **302**, one or more data processors, image processors and/or central processing units **304**, and a peripherals interface **306**. The memory interface **302**, the one or more processors **304** and/or the peripherals interface **306** can be separate components or can be integrated in one or more integrated circuits. The various components in the mobile device **100** can be coupled by one or more communication buses or signal lines.

Sensors, devices and subsystems can be coupled to the peripherals interface **306** to facilitate multiple functionalities. For example, a motion sensor **310**, a light sensor **312**, and a proximity sensor **314** can be coupled to the peripherals interface **306** to facilitate the orientation, lighting and proximity functions described with respect to FIG. **1**. Other sensors **316** can also be connected to the peripherals interface **306**, such as a positioning system (e.g., GPS receiver), a temperature sensor, a biometric sensor, or other sensing device, to facilitate related functionalities.

A camera subsystem **320** and an optical sensor **322**, e.g., a charged coupled device (CCD) or a complementary metal-oxide semiconductor (CMOS) optical sensor, can be utilized to facilitate camera functions, such as recording photographs and video clips.

Communication functions can be facilitated through one or more wireless communication subsystems **324**, which can include radio frequency receivers and transmitters and/or optical (e.g., infrared) receivers and transmitters. The specific design and implementation of the communication subsystem **324** can depend on the communication network(s) over which the mobile device **100** is intended to operate. For example, a mobile device **100** may include communication subsystems **324** designed to operate over a GSM network, a GPRS network, an EDGE network, a Wi-Fi or WiMax network, and a Bluetooth™ network. In particular, the wireless communication subsystems **324** may include hosting protocols such that the device **100** may be configured as a base station for other wireless devices.

An audio subsystem **326** can be coupled to a speaker **328** and a microphone **330** to facilitate voice-enabled functions, such as voice recognition, voice replication, digital recording, and telephony functions.

The I/O subsystem **340** can include a touch screen controller **342** and/or other input controller(s) **344**. The touch-screen controller **342** can be coupled to a touch screen **346**. The touch screen **346** and touch screen controller **342** can, for example, detect contact and movement or break thereof using any of a plurality of touch sensitivity technologies, including but not limited to capacitive, resistive, infrared, and surface acoustic wave technologies, as well as other proximity sensor arrays or other elements for determining one or more points of contact with the touch screen **346**.

The other input controller(s) **344** can be coupled to other input/control devices **348**, such as one or more buttons, rocker switches, thumb-wheel, infrared port, USB port, and/or a pointer device such as a stylus. The one or more buttons (not shown) can include an up/down button for volume control of the speaker **328** and/or the microphone **330**.

In one implementation, a pressing of the button for a first duration may disengage a lock of the touch screen **346**; and a pressing of the button for a second duration that is longer than the first duration may turn power to the mobile device **100** on or off. The user may be able to customize a functionality of one or more of the buttons. The touch screen **346** can, for example, also be used to implement virtual or soft buttons and/or a keyboard.

In some implementations, the mobile device **100** can present recorded audio and/or video files, such as MP3, AAC, and MPEG files. In some implementations, the mobile device **100** can include the functionality of an MP3 player, such as an iPod™. The mobile device **100** may, therefore, include a 36-pin connector that is compatible with the iPod. Other input/output and control devices can also be used.

The memory interface **302** can be coupled to memory **350**. The memory **350** can include high-speed random access memory and/or non-volatile memory, such as one or more magnetic disk storage devices, one or more optical storage devices, and/or flash memory (e.g., NAND, NOR). The memory **350** can store an operating system **352**, such as Darwin, RTXC, LINUX, UNIX, OS X, WINDOWS, or an embedded operating system such as VxWorks. The operating system **352** may include instructions for handling basic system services and for performing hardware dependent tasks. In some implementations, the operating system **352** can be a kernel (e.g., UNIX kernel).

The memory **350** may also store communication instructions **354** to facilitate communicating with one or more additional devices, one or more computers and/or one or more servers. The memory **350** may include graphical user interface instructions **356** to facilitate graphic user interface processing; sensor processing instructions **358** to facilitate sensor-related processing and functions; phone instructions **360** to facilitate phone-related processes and functions; electronic messaging instructions **362** to facilitate electronic-messaging related processes and functions; web browsing instructions **364** to facilitate web browsing-related processes and functions; media processing instructions **366** to facilitate media processing-related processes and functions; GPS/Navigation instructions **368** to facilitate GPS and navigation-related processes and instructions; camera instructions **370** to facilitate camera-related processes and functions; and/or other software instructions **372** to facilitate other processes and functions.

Each of the above identified instructions and applications can correspond to a set of instructions for performing one or more functions described above. These instructions need not be implemented as separate software programs, procedures or modules. The memory **350** can include additional instructions or fewer instructions. Furthermore, various functions of the mobile device **100** may be implemented in hardware and/or in software, including in one or more signal processing and/or application specific integrated circuits.

FIG. **4** is an example user interface that is presented on the mobile device **100** in response to a user selection of, e.g., the maps object **144**. The user interface includes an information display area **400** and a map display area **402**. A position of the mobile device is indicated by an indicator **404**. The information display area **400** receives user input from the touch-sensitive display **102**. In some implementations, upon an input of a location, e.g., California, the user is presented with an object **406** providing an option to save data associated with the input location.

In some implementations, the user provides a "friendly name" to identify the location or group of locations of interest. If, for example, a user would like to save data related to a trip to California, the user can identify the data by entering, e.g., "My Trip to California" into the display area **400**. A user can save the data in accordance with any attribute.

In some implementations, an indicator **406** can be placed on the map display area **402** to indicate a particular geographic location of interest. For example, if the location if interest is in Cupertino, user input can be received from the touch sensitive display **102** to place the indicator **406** on the map display area **402** at either the current location of the mobile device **100** (shown as reference numeral **404**) or a user-specified location.

Where the current location of the mobile device **100** is used to specify the geographic location of interest, according to some implementations, geographic position information can be provided to the mobile device **100** from, for example, Global Positioning System (GPS) coordinate data. The GPS coordinate data can be processed by the GPS/Navigation instructions **368** and can be provided from an external or internal GPS navigation system. Triangulation and external GPS information can be provided to the mobile device **100** through the wireless communication subsystems **324** or port device **190**.

In some implementations, the geographic information regarding the geographic location of interest is manually input by the user. The user can input a street address, a latitude/longitude pair, or other identifying geographic information to specify the geographic location of interest.

After a geographic location of interest has been indicated, in some implementations, an example user interface **500** shown in FIG. **5** is presented on the mobile device **100** in response to invoking the camera object **136**. A next object **502** and back object **504**, are provided to navigate within the user interface **500**. A save object **506** and delete object **508** are provided to operate on pictures captured by the mobile device **100**. In some implementations, audio data is captured as the picture data is captured by the mobile device **100**.

In some implementations, pictures captured by the mobile device are geographically associated with the geographic location of interest when the save object **506** is selected to save the currently displayed picture. In some implementations, the geographic association is automatically performed using the determined position of the mobile device. In some implementations, the geographic association is manually input by a user when touching the save object **506** on the touch-sensitive display **102**.

In some implementations, the association of geographic information with data is performed by geo-tagging the data. For example, geographic position information (e.g., latitude and longitude), geographic place names, or geographical regions are associated with the data. In the example of FIG. **5**, the geographic information could be, for example, latitude 37.331837, longitude −122.030799; or 1 Infinite Loop, Cupertino, Calif., USA. In some implementations, the geographic information can be included as meta tags in a document.

In some implementations, the user interface **500** can be used to capture video when the camera object **136** is invoked by a user. The video data is saved on the mobile device **100** with associated geographic information as described above with regard to pictures data.

Referring to FIG. **6**, notes (e.g., text information or audio information) about the geographic location of interest can be recorded using the notes object **146**. The next object **502** and back object **504**, are provided to navigate within the user interface **600**. The save object **506** and delete object **508** are provided to operate on the notes entered on the mobile device **100**. In the manner described above, notes received by the mobile device **100** are geographically associated with the geographic location of interest when the save object **506** is selected to save the current notes on the mobile device **100**.

In some implementations, touching the indicator **406** presents a menu item to invoke a reviewing user interface **700** such as shown in FIG. **7**. Objects such as view notes **702**, view pictures **704** and view video **706** can be displayed on the user interface **700**. If, for example, the view notes object **702** is selected the user interface of FIG. **6** can be displayed. If, for example, the view pictures object **704** or the view videos object **706** is selected, the user interface of FIG. **5** can be displayed. A navigation object **708** is provided, for example, to return to the previous display (e.g., map display area **402** shown in FIG. **4**).

As shown in FIG. **8**, in some implementations, multiple indicators **406**, **800**, **802**, **804** and **806** can be placed on the map display area **402** to indicate multiple locations of interest. In some implementations, for each geographic location of interest, the user can capture data such as, pictures, notes, audio and video and save it to the mobile device **100** with an association to the geographic location of interest as described above with regard to indicator **406**. In the example interface of FIG. **8**, data associated with Palo Alto, Calif. (indicator **800**) and San Francisco, Calif. (indicators **802**, **804** and **806**) is saved on the mobile device **100**.

In some implementations the data associated with the geographic locations identified by indicators **800**, **802**, **804** and/or **806** can be reviewed in the reviewing user interface **700** of FIG. **7** in response to a selection of indicators **800**, **802**, **804** and/or **806**. For example, if indicator **800** is selected, the user interface **700** is presented, however, the information display area **400** would indicate "Stanford University." Likewise, if indicator **802**, **804** or **806** is selected, the information display area **400** would indicate "San Francisco," or "Downtown San Francisco," "Golden Gate Bridge," or "Alcatraz Island," respectively, if a higher level of detail is desired.

In some implementations, the data on the mobile device **100** associated with locations of interest can be uploaded to a remote storage location at one of the service providers **230**, **240**, **250** and **260** and/or content publishers **260**, or directly to an end-user device **280**.

In some implementations, the data associated with locations of interest can be played back for later viewing as a multimedia presentation. For example, in response to a selection of the maps object **144**, the data saved to "My Trip to California" is retrieved and displayed in a user interface such as FIG. **9**.

In some implementations, the multimedia presentation begins by displaying the indicator **406** on the map display area **402** as shown in FIG. **9**. The presentation continues by showing selected, a predetermined portion, or all pictures, notes, audio and/or video associated with the geographic location specified by the indicator **406**. For example, the user interfaces of FIGS. **4** and **5** can be displayed in response to a selection of the indicator **406** such that users can step through the pictures, notes and/or videos using the navigation objects **802** and **804**.

In some implementations, as shown in FIG. **9**, the multimedia presentation includes an indicator **900** illustrating a traveled route **900** associated with the saved "My Trip to California." The traveled route **900** can be indicated, for example by a line or an arrow that moves from indicator **406** to indicator **800** to illustrate a direction of travel over time. Notes, pictures, audio and/or videos associated with the location specified by indicator **800** (e.g., Stanford University) are accessible to the user as discussed above.

As shown in FIG. **10**, the multimedia presentation illustrates the traveled route indicator **900** moving to the end in San Francisco, Calif., where indicators **802**, **804** and **806** are located. Data associated with indicators **802**, **804** and **806** can be displayed as indicated above with regard to indicator **406**. For example, notes, pictures, audio and/or video associated with downtown San Francisco (e.g., indicator **802**), the Golden Gate Bridge (e.g., indicator **804**), and/or Alcatraz Island (e.g., indicator **806**) can be displayed.

In some implementations, all of the data saved to "My Trip to California" is available at once rather than conveying a notion of time as described above. The user interface of FIG. **10** is used for the presentation of the pictures, notes, audio and/or video associated with the all (or a predetermined subset) of the locations of interest indicated by indicators **406**, **800**, **802**, **804** and **806**. The user interfaces of FIGS. **4** and **5** can be displayed in response to a selection of one of the indicators **406**, **800**, **802**, **804** or **806** such that users can step through the pictures, notes and/or videos using the navigation objects **802** and **804**.

In some implementations, the pictures, notes and/or videos are compiled into a movie using an authoring application that converts and aggregates the pictures, notes, audio and/or video into a multimedia video data file, such as an MPEG-2, MPEG-4 AVL Quicktime, Windows Media, RealVideo, DivX, etc., movie file. The movie can be compiled on a mobile device **100** or remotely by one of the services **230**, **240**, **250** or **260**, or content publishers **270**. For example, in some implementations, the movie begins by displaying a map of the first geographic location of interest (e.g. Cupertino) and then displaying associated pictures, notes and videos taken by the mobile device **100** in-succession. The movie changes scenes to a second geographic location of interest (e.g. Stanford University) to display a map and associated pictures, notes, audio and videos. Finally, the movie continues until the pictures, notes, audio and videos for a final geographic location of interest (e.g., Alcatraz Island) are displayed.

In some implementations, the data associated with geographic locations can be requested by the end-user devices **280** for display. A suitable application running on an end-user device **280** makes a request over the wide area network **214** to, e.g. the media service **250**, the content publisher **274**, or the wireless device **100** the data to be downloaded or to download the compiled movie.

FIG. **11** is a flow diagram of an example process **1100** for indicating geographic locations of interest and acquiring data associated with the geographic locations of interest. At stage **1102**, an indication is received of a geographic location of interest. For example, a location input in the information display area **400** shown in the user interface of FIGS. **4** and **5** is confirmed as a geographic location of interest by a selection of the save object **506**.

At stage **1104**, the geographic position information of the geographic location of interest is ascertained. For example, this information can be manually input or obtained from GPS coordinate data. At stage **1106**, data associated with location is received. For example, notes, pictures, audio and/or video associated with the geographic location of interest is input to the mobile device **100** by a selection of the camera object **136** or the notes object **146**.

At stage **1108**, data is stored with the geographic position information. For example, the notes, pictures, audio and/or video received at stage **1106** are saved with the geographic position information in the mobile device **100**. The geographic position information can be automatically appended to the notes, pictures, audio and/or video, or manually input by the user during the save operation.

At stage **1110**, it is determined if more data is to be associated with the geographic location of interest. If so, the process flows to stage **1106**. If no more data is to be associated with the geographic location of interest, the process returns to stage **1102**.

FIG. **12** is a flow diagram of an example process **1200** for reviewing and editing data associated with geographic locations of interest. At stage **1202**, an indication is received. For example, a user selects the indicator **406** and an option to edit and/or review data associated with the geographic area identified by indicator **406**. At stage **1204**, a user interface is provided (e.g., launched). For example, in accordance with the type of data to be displayed, one of user interfaces **500** or **600** is launched to view and/or edit pictures, videos, and/or notes associated with the geographic location of interest identified by indicator **406**.

At stage **1206**, an indication of an action is received. For example, a user input from one of objects **502**, **504**, **506** and/or **508** is received by the mobile device **100**. At stage **1208**, the received action is performed. For example, a next picture is displayed if the next object **502** is selected, or a previous picture is displayed if the back object **504** is selected. A displayed picture is saved if the save object **506** is selected, or deleted if the deleted object **508** is selected by the user.

FIG. **13** is a flow diagram of an example process **1300** for interactively displaying data associated with geographic locations of interest. At stage **1302**, an indication is received. For example, after invoking the maps object **144**, the user selects data associated with "My Trip to California." At stage **1304**, data is retrieved. For example, the data associated with the saved locations of interest identified by "My Trip to California" is retrieved from the memory **350** in the mobile device **100**.

At stage **1306**, a user interface is displayed. For example, the user interface of FIG. **9** is displayed on the mobile device **100**. At stage **1308**, an indication of location is received. For example, the user selects indicator **406** on the touch sensitive display **102**. At stage **1310**, data is presented. For example, the interface of FIG. **7** is displayed, from which the user can select to view notes, pictures, audio and/or video. In accordance with the selection made by the user, the user interface **500** or **600** is presented to view the data requested.

After the data is presented, the flow returns to stage **1306**. For example, when the user selects the back object **708**, the user interface of FIG. **9** (or FIG. **10**) is displayed.

FIG. **14** is a flow diagram of an example process **1400** for playback of data associated with one or more geographic locations of interest. At stage **1402**, an indication is received. For example, a location input in the information display area **400** shown in the user interface of FIGS. **4** and **5** is confirmed as a geographic location of interest, or a selection of object on the touch sensitive display **102** is received.

At stage **1404**, an application is launched. For example, a playback application (e.g., media player) executing on the mobile device **100** or end-user device **280** is launched. At stage **1406**, data is retrieved. For example, data associated with the geographic location of interest is retrieved from the memory **350** or from a remote location and communicated over the wide area network and/or wireless network to the mobile device **100** or end-user device **280**.

At stage **1408**, a user interface is presented. For example, the user interface associated with the media player is displayed on the mobile device **100** or end-user device **280**.

At stage **1410**, the data associated with the geographic location of interest is presented in the user interface. In accordance with a playback mode, the notes, pictures, and/or video associated with the geographic locations of interest are played back in sequence without any user interaction.

The disclosed embodiments can be implemented in a computing system that includes a back-end component, e.g., as a data server, or that includes a middleware component, e.g., an application server, or that includes a front-end component, e.g., a client computer having a graphical user interface or a Web browser through which a user can interact with an implementation of what is disclosed here, or any combination of one or more such back-end, middleware, or front-end components.

The components of the system can be interconnected by any form or medium of digital data communication, e.g., a communication network. Examples of communication networks include a local area network ("LAN") and a wide area network ("WAN"), e.g., the Internet.

The computing system can include clients and servers. A client and server are generally remote from each other and typically interact through a communication network. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.

While this specification contains many specifics, these should not be construed as limitations on the scope of what being claims or of what may be claimed, but rather as descriptions of features specific to particular embodiments. Certain features that are described in this specification in the context of separate embodiments can also be implemented in combination in a single embodiment. Conversely, various features that are described in the context of a single embodiment can also be implemented in multiple embodiments separately or in any suitable sub-combination. Moreover, although features may be described above as acting in certain combinations and even initially claimed as such, one or more features from a claimed combination can in some cases be excised from the combination, and the claimed combination may be directed to a sub-combination or variation of a sub-combination.

Similarly, while operations are depicted in the drawings in a particular order, this should not be understand as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results. In certain circumstances, multitasking and parallel processing may be advantageous. Moreover, the separation of various system components in the embodiments described above should not be understood as requiring such separation in all embodiments, and it should be understood that the described program components and systems can generally be integrated together in a single software product or packaged into multiple software products.

Various modifications may be made to the disclosed implementations and still be within the scope of the following claims.

What is claimed is:

1. A method comprising:

displaying a map of a geographic region in a user interface of a mobile device;

receiving, from a location system of the mobile device, data representing a geographic location of the mobile device;

displaying, in association with the map displayed on the mobile device, an indicator representing the geographic location of the mobile device;

receiving, at the mobile device, user input representing a selection of the displayed indicator representing the geographic location of the mobile device;

receiving, at the mobile device, user input representing a selection of data stored on data storage of the mobile device, wherein the selected data includes text, images, audio or video;

associating the selected data with the data representing the geographic location; and

storing, on the mobile device, data representing the association of the geographic location and the selected data.

2. The method of claim **1**, comprising:

receiving, at the mobile device, input selecting a second geographic location;

receiving, at the mobile device, a selection of second data stored on data storage of the mobile device, wherein the second selected data includes text, images, audio or video;

associating the second selected data with data representing the second geographic location; and

storing, on the mobile device, data representing the association of the geographic location and the second selected data.

3. The method of claim **2**, comprising displaying, in association with the

map displayed on the mobile device, an indicator representing the second geographic location.

4. The method of claim **3**, comprising:

displaying, in association with the map displayed on the mobile device, an indicator representing the second geographic location;

receiving a selection of one of the two indicators; and

displaying, on the mobile device, the selected data as associated with the selected indicator.

5. The method of claim **1**, comprising communicating, to a device external

of the mobile device, the selected data and the data representing the association of the geographic

location and the selected data.

6. The method of claim **1**, comprising capturing data by an input facility of

the mobile device, wherein the selected data includes the captured data.

7. The method of claim **6**, wherein the input facility includes at least one of

a camera, a microphone, and a touchscreen display.

8. A non-transitory computer-readable medium including one or more

sequences of instructions which, when executed by one or more processors, causes operations

comprising:

displaying a map of a geographic region in a user interface of a mobile device;

receiving, from a location system of the mobile device, data representing a geographic location of the mobile device;

displaying, in association with the map displayed on the mobile device, an indicator representing the geographic location of the mobile device;

receiving, at the mobile device, user input representing a selection of the displayed indicator representing the geographic location of the mobile device;

receiving, at the mobile device, user input representing a selection of data stored on data storage of the mobile device, wherein the selected data includes text, images, audio or video;

associating the selected data with the data representing the geographic location; and

storing, on the mobile device, data representing the association of the geographic location and the selected data.

9. The non-transitory computer-readable medium of claim **8**, the operations

comprising:

receiving, at the mobile device, input selecting a second geographic location;

receiving, at the mobile device, a selection of second data stored on data storage of the mobile device, wherein the second selected data includes text, images, audio or video;

associating the second selected data with data representing the second geographic location; and

storing, on the mobile device, data representing the association of the geographic location and the second selected data.

10. The non-transitory computer-readable medium of claim **9**, the operations

comprising:

displaying, in association with the map displayed on the mobile device, an indicator representing the second geographic location.

11. The non-transitory computer-readable medium of claim **10**, the operations

comprising:

displaying, in association with the map displayed on the mobile device, an indicator representing the second geographic location;

receiving a selection of one of the two indicators; and

displaying, on the mobile device, the selected data as associated with the selected indicator.

12. The non-transitory computer-readable medium of claim **8**, the operations

comprising:

communicating, to a device external of the mobile device, the selected data and the data representing the association of the geographic location and the selected data.

13. The non-transitory computer-readable medium of claim **8**, the operations

comprising:

capturing data by an input facility of the mobile device, wherein the selected data includes the captured data.

14. The non-transitory computer-readable medium of claim **13**, wherein the

input facility includes at least one of a camera, a microphone, and a touchscreen display.

15. A system comprising:

one or more processors; and

a non-transitory computer-readable medium including one or more sequences of instructions which, when executed by one or more processors, causes operations comprising:

displaying a map of a geographic region in a user interface of a mobile device;

receiving, from a location system of the mobile device, data representing a geographic location of the mobile device;

displaying, in association with the map displayed on the mobile device, an indicator representing the geographic location of the mobile device;

receiving, at the mobile device, user input representing a selection of the displayed indicator representing the geographic location of the mobile device;

receiving, at the mobile device, user input representing a selection of data stored on data storage of the mobile device, wherein the selected data includes text, images, audio or video;

associating the selected data with the data representing the geographic location; and

storing, on the mobile device, data representing the association of the geographic location and the selected data.

16. The system of claim **15**, the operations comprising:

receiving, at the mobile device, input selecting a second geographic location;

receiving, at the mobile device, a selection of second data stored on data storage of the mobile device, wherein the second selected data includes text, images, audio or video;

associating the second selected data with data representing the second geographic location; and

storing, on the mobile device, data representing the association of the geographic location and the second selected data.

17. The system of claim **16**, the operations comprising:

displaying, in association with the map displayed on the mobile device, an indicator representing the second geographic location.

18. The system of claim **17**, the operations comprising:

displaying, in association with the map displayed on the mobile device, an indicator representing the second geographic location;

receiving a selection of one of the two indicators; and

displaying, on the mobile device, the selected data as associated with the selected indicator.

19. The system of claim **15**, the operations comprising:

communicating, to a device external of the mobile device, the selected data and the data representing the association of the geographic location and the selected data.

20. The system of claim **15**, the operations comprising:

capturing data by an input facility of the mobile device, wherein the selected data includes the captured data.

21. The system of claim **20**, wherein the input facility includes at least one of

a camera, a microphone, and a touchscreen display.

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